ronlabs
smartpipette

Operating Manual
single channel

DETAIL VIEW▶

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smartpipette

Electronic pipette

Silver-nano series

Evolutional pipette design, superior user-friendly product support

Innovation In Action

Ronlabs service provider to global premier

RONLABS SCIENTIFIC INSTRUMENT CO.,LTD

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1. Introduction

smartpipette is the newest generation of electronic pipette utilizing air replacement concept to aspirate and dispense liquid. smartpipette incorporates many breakthrough features such as comfortable design suitable for griping and operating on right or left hand, Color screen for clear visualization, frequent interval calibration to insure the linearity and accuracy of each single measurement, wide range of operation modes to meet the needs of high end research purpose.

5 common modes and 4 special modes enable all kind of operations demanded in labs. Clear and simplified interface make it a user friendly instrument.

Channel	Product code	Model	Range	Increment	RONLABS Tip
Single	601011	S10	0.2--10μL	0.01μL	10μL
	601021	S100	5--100μL	0.1μL	200,300μL
	601031	S300	20--300μL	0.5μL	300,500μL
	601041	S1200	100--1200μL	1μL	1000,1200μL
	601051	S5mL	500--5000μL	5μL	5mL
	601061	S10mL	1--10mL	0.01mL	10mL

2. Package contents

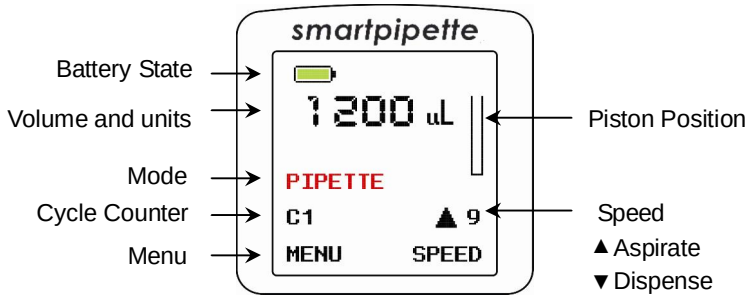
Parts check list：

- Electronic pipette
- Battery block
- Battery charger
- Lubricate
- USB cable
- User manual
- Warrantee card

Please check the package contents immediately to ensure free of transportation damage or loss.

3. Product descriptions

3.1 Screen：



3.2 Keypad：

① Left

- Menu
- Confirm（OK、YES）
- EDIT

② Selection（Up or Down）

- Change Parameter
- Select Parameter

③ Right

- Speed Adjustment
- EXIT

④ Start（or PIP）

- Start
- Aspirate or dispense

⑤ Tip ejection button

Note: If Picture or operation instruction described in this manual is different from the product, Please always refer to the product.

⑥ Reset

- Restart and return to mail screen and factory setting
- Start calibration mode

⑦ USB

- Power supply

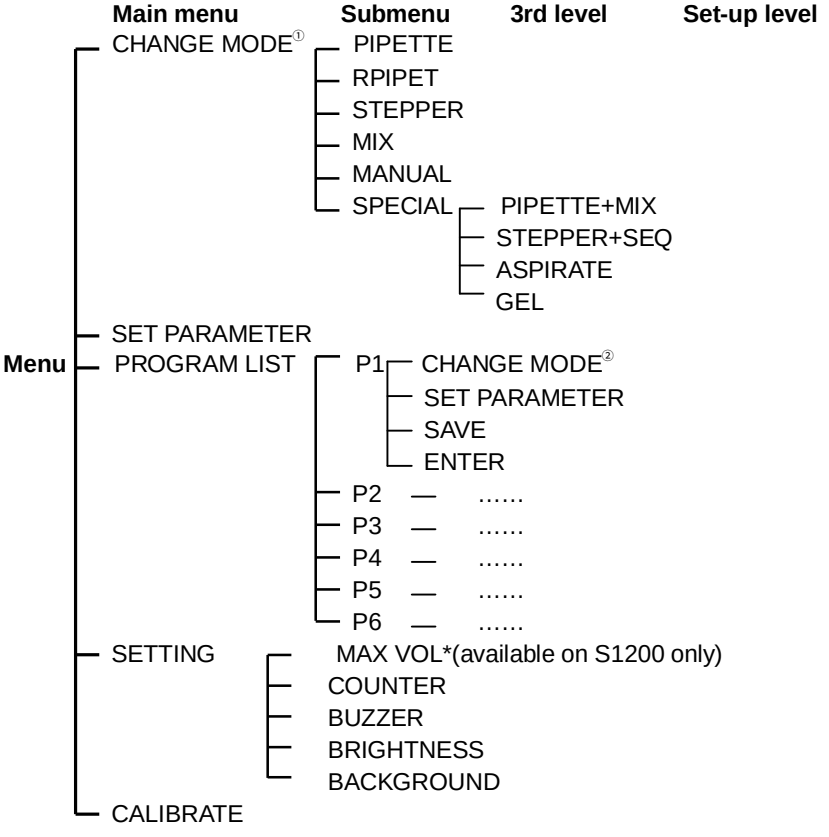
⑧ Battery Holder

- Install or replace battery

⑨ Finger rest

- Suitable for either right or left hand operator

3.3 Menu：



Note：CHANGE MODE② serve the same function as CHANGE MODE①

4. Operations

4.1 Battery

Note：

① We strongly recommend you fully charge the battery before using the pipette.

② You must only use RONLABS original battery and battery charger. Any damage caused by using substitute accessory will not be covered by warrantee.

③ Please charge your battery indoor.

④ Do not place the battery in contact with metal surface.

⑤ Battery disposal should be done in accordance to local regulation. Separate such battery with your daily garbage is highly recommended.

⑥ Never expose battery on extremely high temperature, which may cause explosion.

Battery (specification)：

Lithium-Ion Battery
Voltage：3.7V
Capacity：900mAh
Maximum charging voltage：4.2V
Charging times：2 hours will achieve a full charge [with original charger, item number：693201]

Battery charger (specification)

Input：AC 100-240V, 50/60Hz, Max 0.15A
Output：USB 5V, 500mA

Installing/Replacing batteries

1. Press the cover of battery holder down and push toward the direction indicated on battery holder.

2. Insert the battery block accordingly.

3. Restore the cover of battery holder.

Battery state indication on screen

Green: Full charged

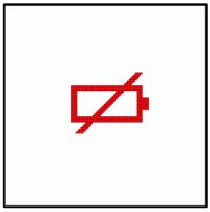
Black (white background) or White (black background): Partial charged.

Red: Low battery indication (recharge or replace battery is recommended).

Insufficient battery indication：When power is extremely low and insufficient to support mechanism during operation process, main screen appears “PIP” indication.

Note:

Following icon and alarm will remind you to recharge or replace battery when PIP (start) button is clicked again.



When you see the reminding message, recharge or replace battery immediately. The power will go off in 90 seconds.

Recharging battery

Before connecting charger with power supply, make sure the input voltage is compatible. After Connecting charger and pipette with USB cable, insert plug into electric outlet.

Note：

1. Color of battery state indications
   Blinking black (or white) state-bar indicates power is being charged. Blinking green state-bar indicates power has been full charged.
2. It is normal that temperature of battery will be higher when it is being charged.
3. Excessive charge of the battery may damage the battery or shorten the battery life.
4. Old battery may cause malfunction of the pipette. It is recommended to replace battery block in every 2 years.

4.2 Fitting and ejecting tips

Fitting tips

Make sure you select compatible tips. The recommended fitting method is to insert pipette perpendicularly into the tip, rotate the tip 180 degree left and right for firm fitting.

smartpipette is basically compatible to tips of major brand.

Notice：Liquid should never enter the tip holder.

Eject the tip

smartpipette incorporate ergonomic tip ejection design. Gently push ejection button, the tip will be ejected from the pipette.

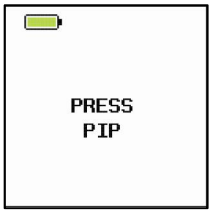
4.3 Getting start

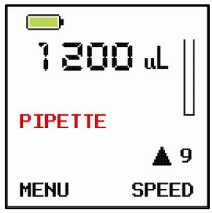
4.3.1 Turn-on and Stand-by

① Turn- On

Smartpipette is turned on automatically when the battery block is inserted accordingly. The screen will then display “RONLABS smartpipette”; press **PIP** in sequence.

After press **PIP**, screen will display **“AUTOTEST”** (piston diagnostic is on the working). When self diagnostic is over, screen should return to main menu or pipette mode. Example of model S1200 is shown as follow：





Notice: If “CHECK PISTON” is displayed, the message indicates piston is moving irregularly. Disassemble bottom section to find out the cause of the problem. Please refer to chapter 6 for trouble shooting and remedy.

② Stand-by

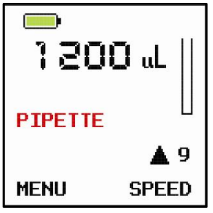
If operation is paused for more then 2 minutes, pipette enters stand-by mode. Press PIP will resume to previous state.

Note：

1. If liquid is not dispensed during pipetting process (or the pipetting cycle is not completed), pipette will not enter stand-by mode.
2. If pipette will not be used for long period of time, remove battery block to ensure battery life.

4.3.2 System set-up

Press **left** key to enter main menu. Press **selection** key to select setting. Press OK to confirm. The parameter setting of pipette mode can be done from sub-menu.



MAX VOL(Max Volume)：Only available on S1200 model which can be set to 1000μL or 1200μL，other models such as S10,S100,S300,S5mL,S10mL are fixed value for this parameter.

COUNTER：ON or OFF to select whether counting the cycle is required.

BUZZER：ON or OFF to select whether alarm for low battery is required.

BRIGHTNESS：1-6 level can be set according to personal favor.

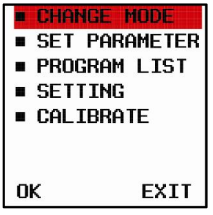
BACKGROUND：Customize background color to be black or white (black = 1，white =2)

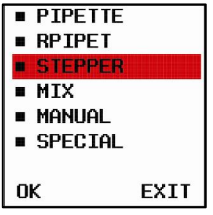
Set-up：

Press **selection** key to select setting item, then **edit**. When the value is highlighted in red and blinking, press **selection** key will adjust value. Then press **left** key to confirm, **right** key to exit and return to previous menu.

4.3.3 Pipette Modes

Press **left** button to enter menu; highlight **CHANGE MODE** and **OK** to enter. Press **selection** key to select target mode and **OK** to confirm.





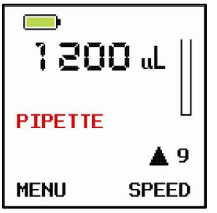
4.3.4 Set-up Parameter

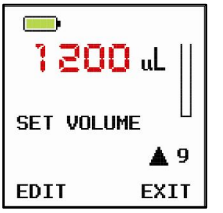
There are 2 ways to set up parameter：

① **On main screen：****Selection**, **Left**, **Right** buttons are all you need to access quick setting. Please refer to next chapter for detail description.

② **From SET PARAMETER**：Follow the steps underneath allow you to set up parameters easily.

Menu⇒ SET PARAMETER（use selection key）【**EXIT** will return to previous screen】; OK to enter parameter setting. Consequently, parameter setting can be done with **Selection**, **Left**, and **Right** buttons. (Refer to following chapter for detail description).

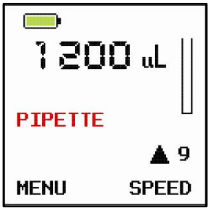




4.4 Modes description

4.4.1 PIPETTE mode

PIPETTE mode is also known as automatic mode, which aspirate and dispense according to set up value. This mode, incorporates auto purge function to ensure no retention on the tip, is most common for beginner.



PARAMETER Set-up

VOLUME：Value between valid range is available for set-up. Factory default setting is the maximum volume given in the specification.

IN SPEED：Default setting is 9. Available range is 1～9.

OUT SPEED：Same as IN SPEED. Maximum speed is 9.

Setting Methods

From main screen or SET PARAMETER is available.

① **Main Screen**

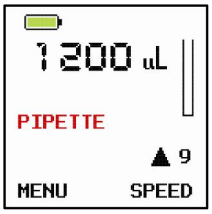
To increase volume：Press **selection up** key, to decrease volume: Press **selection down** key.

Setting aspirate speed：Press **right** button before aspirating.

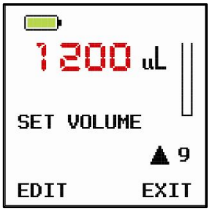
Setting dispense speed：Press **right** button after aspirating.

② **SET PARAMETER**

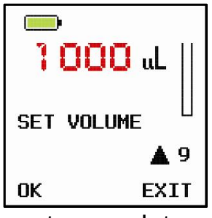
(1) MENU ⇒ SET PARAMETER



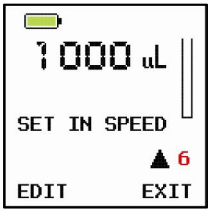
(2) OK ⇒ **selection** key ⇒ **EDIT** (Parameter is blinking and ready for set up).

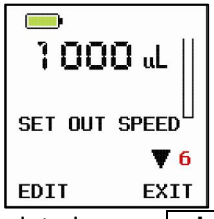


(3) Press **selection** key to change values and confirm with **OK.** .



(4) Repeat above process to complete speed setting of aspirate and dispense.





(5) After parameter setting is completed, press **selection down** key; **SAVE AND EXIT** is prompted, **YES** to confirm, YES blink, **YES** to confirm 1 more time.

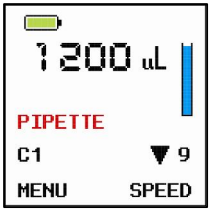
(6) Press **EXIT** to return to main screen.

Note：If you wish not to save the change of parameter, Press NO to abort and return to main screen.

Operation of PIPETTE mode

Select PIPETTE mode, set volume and speed, operation is ready.

1. Immerse the tip perpendicular to liquid and press **PIP**, liquid is aspirated into the tip.
2. When aspirate is completed, remove the tip from liquid; gently touch the tip on edge of vessel to clean up excessive liquid.



3. Press **PIP** to dispense liquid. Alarm is designed to notice the completion of 1 operation cycle.
4. If different type of liquid sample is aspirated, new tip should be replaced to prevent contamination.

Notice：Keep pressing PIP key until tip is removed from the liquid will prevent re-aspirate caused by piston relocation. This function is designed to ensure the precision of small volume pipetting.

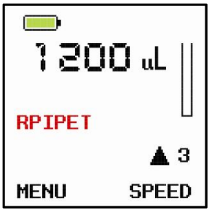
Note:

1. During aspirating cycle, do not dip the tip to the bottom of the vessel. This way may influence the accuracy.
2. After aspirate, wait for 1 second (sample volume <1000μL) to 3 second (sample volume >1000μL) before removing the tip from liquid.
3. If sample's viscosity or density is higher then water, pre-rinse 2-3 times before operation is recommended. Pre-rinsing consists of aspirating certain volume of liquid and then dispensing it back into the same vessel (or waste).
4. Tips should be immersed approximately 3mm for smaller models as S10,S100,S300,S1200，and 5mm for larger models

as S5mL,S10mL.

5. After 1 operation cycle (aspirating and dispensing), make sure that you hear alarm (2 ticks) before next operation cycle.

4.4.2 RPIPET mode



Rpipet will fill extra volume when aspirating. Dispense is done in 2 steps. First step is to dispense required volume. Second step is to dispense the rest of volume. This mode is especially suitable to viscous liquid.

Parameter set-up

VOLUME：Value between valid range is available for set-up. Factory default setting is the maximum volume given by specification.

IN SPEED：Default setting is 9. Available range is 1～9.

OUT SPEED：Same as IN SPEED. Maximum speed is 9.

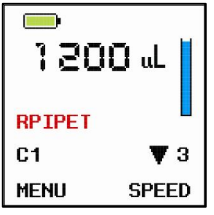
Setting Methods

From main screen or SET PARAMETER is available. (Refer to parameter set-up on PIPETTE mode for detail description)

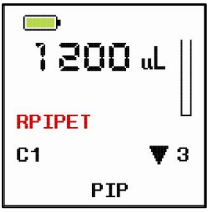
Operation of RPIPET mode

Select RPIPET mode, set volume and speed, operation is ready.

1. Immerse the tip perpendicular to liquid and press **PIP**; liquid is aspirated into the tip.
2. When aspirate is completed, remove the tip from liquid; gently touch the tip on edge of vessel to clean up excessive liquid.



3. Press **PIP** to dispense desired volume. There are still extra liquid in the tip. Screen will display **PIP** as follow.



4. Press **PIP** to clear the rest of liquid from the tip.
5. If required, replace the tip before next operation.

4.4.3 STEPPER mode

This mode fill-in total required volume （Total required volume=volume × times of dispense）and dispense equal volume in number of times. It is special suitable for repeating operation of same volume. The diagram on the right indicates total of 1000μL will be filled-in at once and dispense in 5 times × 200μL/time.

Parameter set-up

VOLUME：Value between valid ranges is available for set-up.

TIMES： ”Times” in this mode indicate times of dispense. This parameter can be set up from SET PARAMETER menu, not from main screen.

Notice：Times of dispense × volume/times has to be no larger then maximum volume given in the spec. The program will automatically reduce times of dispense if above calculation is violated.

Different model of smartpipette has different factory default settings as follow:

S10：VOLUME =2μL，TIMES=5

S100：VOLUME =20μL，TIMES=5

S300：VOLUME =20μL，TIMES=5

S1200：VOLUME=200μL，TIMES=5

S5mL：VOLUME =1000μL，TIMES=5

S10mL：VOLUME=2mL，TIMES=5

IN SPEED：Default setting is 9. Available range is 1～9.

OUT SPEED：Same as IN SPEED. Maximum speed is 9.

Setting Methods

From main screen or SET PARAMETER is available. (Refer to parameter set-up on PIPETTE mode for detail description)

Operation of STEPPER mode

Select STEPPER mode; set volume and times; operation is ready.

1. Immerse the tip perpendicular to liquid and press **PIP**; liquid is aspirated in to the tip.
2. When aspirate is completed, remove the tip from liquid; gently touch the tip on edge of vessel to clean up excessive liquid.
3. Press **PIP** for number of times to sequentially dispense. The number of times left to dispense is displayed on screen.
4. When total number of times to dispense is completed, there are extra liquid in the tip. Press **PIP** to purge the extra liquid.
5. If required, replace new tip for next operation.

4.4.4 MIX mode

This mode is achieved by repeatedly aspirating and dispensing according to the parameters. Diagram on the right indicates 200μL of liquid is aspirated and dispensed for 5 times.

Parameter set-up

MIX VOL：Value between valid range is available for set-up.

MIX TIMES：Times of mixing (aspirating and dispensing cycle= 1 time); maximum setting value is 200. Counter will not display 3 digits (100-200). This parameter setting can only be done from SET PAREMETER menu.

Different model of smartpipette has different factory default setting as follow:

S10：MIX VOL=2μL，MIX TIMES=5

S100：MIX VOL=20μL，MIX TIMES=5

S300：MIX VOL=20μL，MIX TIMES=5

S1200：MIX VOL=200μL，MIX TIMES=5

S5mL：MIX VOL=1000μL，MIX TIMES=5

S10mL：MIX VOL=2mL，MIX TIMES=5

IN SPEED：Default setting is 9. Available range is 1～9.

OUT SPEED：Same as IN SPEED. Maximum speed is 9.

Setting Methods

From main screen or SET PARAMETER is available. (Refer to parameter set-up on PIPETTE mode for detail description)

Operation of MIX mode

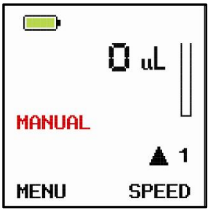
Select MIX mode; set volume, speed and times; operation is ready.

1. Immerse the tip perpendicular to liquid and press **PIP**; liquid is aspirated in to the tip.
2. When mixing process is completed, pipette stop.
3. Extra liquid is still in the tip; Press PIP to purge.
4. If required, replace the tip before next operation.

Notice: Press PIP for more then 1 second will abort the operation instantly.

4.4.5 MANUAL mode

This mode allows operator to control volume, start and stop the aspirate and dispense.



Parameter set-up

VOL LIMIT：Value between valid range is available for set-up. Factory default setting is the maximum volume given by specification.

IN SPEED：Default setting is 9. Available range is 1～9.

OUT SPEED：Same as IN SPEED. Maximum speed is 9.

Setting Methods

From main screen or SET PARAMETER is available.
(Refer to parameter set-up on PIPETTE mode for detail description)

Operation of MANUAL mode

Select MANUAL mode; set speed; operation is ready.

1. Immerse the tip perpendicular to liquid and press **PIP** and hold until desired volume of liquid is aspirated in to the tip.
2. When the screen display the volume has reached the target,

release the **PIP** button.【Do not release the button until the volume has reached the target】

3. When aspirate is completed, Remove the tip from liquid; gently touch the tip on edge of vessel to clean up excessive liquid.
4. Press **selection down** button to switch from aspirate to dispense. The screen will indicate the direction mark change from ▲ to ▼. Press down **PIP** until dispense is completed. If maximum volume of the pipette is aspirated, the operation will automatically switch from aspirate to dispense. All you need to do is to press down **PIP** to complete dispense.
5. After 1 operation cycle (aspirating and dispensing), screen display **PIP** instruction. Press **PIP** to clean up the rest of liquid in the tip. Make sure that you hear alarm (2 ticks) before next operation cycle.

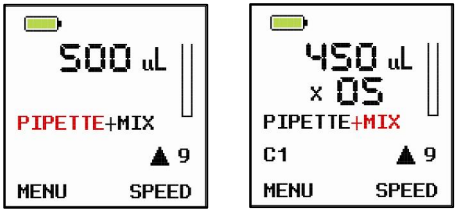
Notice：It is recommended to use lower speed, for this mode, to ensure the best operation result.

4.4.6 4 special pipette modes

SPECIAL has 4 special modes under this menu：

① PIPETTE+MIX

This mode allows operator to mix sample after dispense, suitable for sampling and dilute sampling.



Parameter set-up

PIPETTE VOLUME：Value between valid ranges is available for set-up.

MIX VOL：Value between valid ranges is available for set-up.

MIX TIMES：Times of mixing (aspirating and dispensing cycle= 1 time); maximum setting value is 200. Counter will not display 3 digits (100-200). This parameter setting can only be done from SET PAREMETER menu.

Different model of smartpipette has different factory default setting as follow:

S10：PIPETTE VOL=5μL，MIX VOL=4.5μL，MIX TIMES=5

S100：PIPETTE VOL=50μL，MIX VOL=45μL，MIX TIMES=5

S300：PIPETTE VOL=50μL，MIX VOL=45μL，MIX TIMES=5

S1200：PIPETTE VOL=500μL，MIX VOL=450μL，MIX TIMES=5

S5mL：PIPETTE VOL=1000μL，MIX VOL=500μL，MIX TIMES=5

S10mL：PIPETTE VOL=5mL，MIX VOL=4.5mL，MIX TIMES=5

IN SPEED：Default setting is 9. Available range is 1～9.

OUT SPEED：Same as IN SPEED. Maximum speed is 9.

Setting Methods

From main screen or SET PARAMETER is available. (Refer to parameter set-up on PIPETTE mode for detail description)

Operation of PIPETTE+MIX mode

Select PIPETTE+MIX mode; set all parameters; operation is ready:

1. Immerse the tip perpendicular to liquid and press **PIP**; liquid is aspirated in to the tip.
2. When aspirate is completed, remove the tip from liquid; gently touch the tip on edge of vessel to clean up excessive liquid.
3. Press **PIP** to dispense the sample.
4. Press **PIP** again to perform MIX function. MIX function stop when the cycle complete.
5. Press **PIP** again to clear the rest of liquid in the tip.
6. If required, replace the tip for next operation.

Notice：During mixing process, press PIP for more then 1 second will abort the operation instantly.

② STEPPER+SEQ

This mode fill-in total required volume（Total required volume= $V_{01}+V_{02}+V_{03}$… of dispense）and dispense a number of different volume samples. Extra volume of sample will be aspirated to achieve the best result.

Parameter set-up

VOLUME：Value between valid ranges is available for set-up.

V_{01}、V_{02}、V_{03}...：The volume to be dispensed each time. Sum of the total volume should not excess the maximum volume of the pipette. If volume of the last dispense is smaller then lower volume limit of the pipette, this dispense will be treated as waste, purged out with any extra liquid.

Different model of smartpipette has different factory default setting as follow:

S10：TOTAL VOL=10μL，V_{01}=5μL,V_{02}=5μL

S100：TOTAL VOL=100μL，V_{01}=50μL,V_{02}=50μL

S300：TOTAL VOL=100μL，V_{01}=50μL,V_{02}=50μL

S1200：TOTAL VOL=1000μL，V_{01}=500μL,V_{02}=500μL

S5mL：TOTAL VOL=1000μL，V_{01}=500μL,V_{02}=500μL

S10mL：TOTAL VOL=10mL，V_{01}=5mL,V_{02}=5mL

IN SPEED：Default setting is 9. Available range is 1～9.

OUT SPEED：Same as IN SPEED; maximum speed is 9.

Setting Methods

From main screen or SET PARAMETER is available.(Refer to parameter set-up on PIPETTE mode for detail description)

Volume of sequence dispense can be set after aspirate of total required volume.

If total volume 1000μL is to dispense in 3 sequences (450μL + 400μL + 150μL) the setting example would be as follow:

1. **MENU**⇒**CHANGE MODE**; select **SPECIAL** ⇒**OK** ⇒ select **STEPPER+SEQ** ⇒**OK.**

2. Press **PIP** to aspirate sample. Screen display 500μL; move **selection** key to set the target volume to 450μL.

3. Press **PIP** to proceed first dispenses (450µL); Screen then display default of V_{02} is 450µL, Press **selection** key to set the target to 400µL as follow:

4. Press **PIP** to dispense V_{02}. The rest of 150µL will be displayed as follow; Press **PIP** to dispense V_{03}; Press **PIP** again to clean up the extra liquid

Operation of STEPPER+SEQ mode

Select STEPPER+SEQ mode; set all parameters; operation is ready:

1. Immerse the tip perpendicular to liquid and press **PIP**; total required volume is aspirated into the tip.
2. When aspirate is completed, remove the tip from liquid; gently touch the tip on edge of vessel to clean up excessive liquid.
3. Press **selection** key to set up $V_{01,}$ volume of first dispense.
4. Press **PIP** to dispense sample of V_{01}; screen display volume of second dispense V_{02}.
5. Repeat process 3 and 4 until all liquid in the tip is dispensed.
6. After all liquid is dispensed, screen display **PIP**; press **PIP** to clean up the rest of liquid.

③ ASPIRATE

This mode works as reverse function of STEPPER. It fills in equal volume in number of times and dispenses the total volume at once (total volume for dispense = volume × times of aspirate).

Parameter set-up

VOLUME：Value between valid ranges is available for set-up.

TIMES："Times" in this mode indicate times of dispense. This parameter can be set up from SET PARAMETER menu, not from main screen.

Note：

(Times of aspirate × volume/times) has to be no larger then maximum volume of given specification. The program will automatically reduce times of aspirate if above calculation is violated.

Different model of smartpipette has different factory default setting as follow:

S10：VOLUME=2μL，TIMES=5

S100：VOLUME=20μL，TIMES=5

S300：VOLUME=20μL，TIMES=5

S1200：VOLUME=200μL，TIMES=5

S5mL：VOLUME=500μL，TIMES=5

S10mL：VOLUME =2mL，TIMES=5

IN SPEED：Default setting is 9. Available range is 1～9.

OUT SPEED：Same as IN SPEED. Maximum speed is 9.

Setting Methods

From main screen or SET PARAMETER is available. (Refer to parameter set-up on PIPETTE mode for detail description)

Operation of ASPIRATE mode

Select ASPIRATE mode; set volume and times; operation is ready.

1. Immerse the tip perpendicular to liquid and press **PIP**; liquid is aspirated in to the tip. Screen display times for the rest of sampling.

2. When first aspirate is completed, remove the tip from liquid; gently touch the tip on edge of vessel to clean up excessive liquid.
3. Immerse the tip perpendicular to second liquid sample and press **PIP**, the 2nd liquid sample is aspirated in to the tip. Screen display times to be aspirated for the rest of liquid.
4. Repeat the process until total volume is aspirated; screen display the rest of times is 0; volume of total fill-in.
5. Press **PIP** to dispense the sample.
6. If required, replace new tip for next operation.

④ GEL

This mode is specially designed for gel pipetting. Aspirate speed is adjustable; dispense speed is set to be low to prevent sample overflow. The function is appropriate for handling viscous sample.

Parameter set-up

VOLUME：Value between valid range is available for set-up.

IN SPEED：Default setting is 9. Available range is 1～9.

OUT SPEED：Fix.

Note: S10、S100、S300 OUT SPEED default is 1；
S1200、S5mL、S10mL OUT SPEED default is 2.

Setting Methods

From main screen or SET PARAMETER is available. (Refer to parameter set-up on PIPETTE mode for detail description)

Operation of GEL mode

Select GEL mode; setting up all parameters; operation is ready.

1. Immerse the tip perpendicular to liquid and press **PIP**, liquid is aspirated in to the tip.
2. Remove the tip from liquid; gently touch the tip on edge of vessel to clean up excessive liquid.
3. Press **PIP** to dispense the sample.
4. After dispense, screen display **PIP** . Press **PIP** to clear up the rest of sample.
5. If required, replace new tip for next operation.

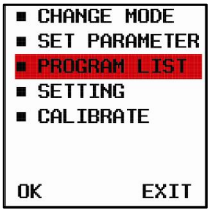
4.5 PROGRAM LIST

There are 6 quick access addresses for operators to store personal programs.

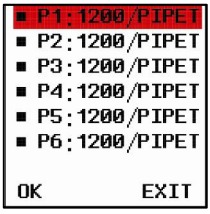
Program pre-set

① Set-up pipette mode

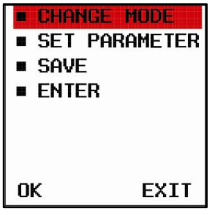
1. **MENU** ⇒scroll to select **PROGRAM LIST**



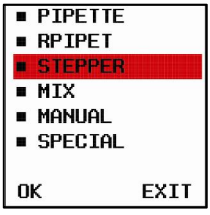
2. **OK** to access set up programs，There are 6 addresses available： Default is 1200/PIPET; Scroll to select target address for customization.



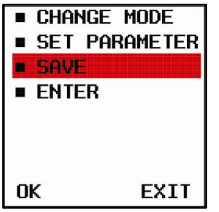
4. **OK** to enter set up screen as follow:



5. Select **CHANGE MODE** ⇒ **OK** to set up desired pipette mode such as STEPPER or others as follow:



6. **OK** and return to step 3. Select **Save** ⇒**OK** to store the setting as follow; this program now has been saved as system default; or **EXIT** to return to previous menu.



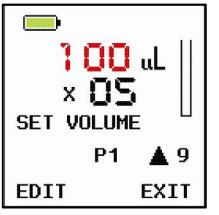
② Parameter set-up

Parameter set up for quick access program can only be done from program list. Detail steps are described as follow:

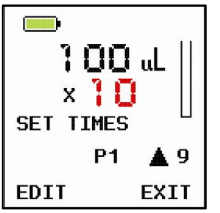
Take STEPPER mode as example;

If the desired program for STEPPER mode is to dispense 100μL for 10 times.

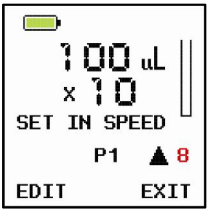
1. **MENU** ⇒ scroll to select **PROGRAM LIST**⇒ OK⇒ scroll to select **P1**⇒**EDIT**⇒ scroll to select **CHANGE MODE**⇒ scroll to select **STEPPER**⇒**OK**
   (P1 now is set up to be STEPPER mode)
2. Scroll to select **SET PARAMETER**⇒ **OK** to enter set up screen ⇒Scroll to select sample volume(value in red indicates the parameter like to be edit)⇒ **EDIT**⇒ blinking (edit ready)⇒**selection** key to change the value to 100μL⇒ **OK** to confirm and return to screen as follow:

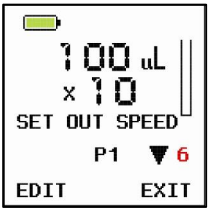


2. Scroll to select **times** of dispense⇒ **EDIT**⇒ blinking (edit ready)⇒ **Selection** key to change value to 10; **OK** to confirm and return to screen as follow:.

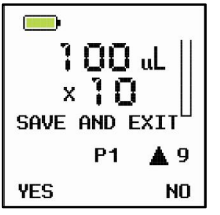


3. Scroll **selection** key to select aspirate speed (in speed) ⇒**EDIT** ⇒ blinking (edit ready)⇒scroll **selection** key to change value （desired speed）⇒ **OK** to confirm and continue the setting of dispense speed (out speed) in the same method.





4. **Scroll down** ⇒ **SAVE AND EXIT** is prompted⇒ **YES**⇒ blinking for confirmation⇒ **YES** to confirm and return to previous screen.

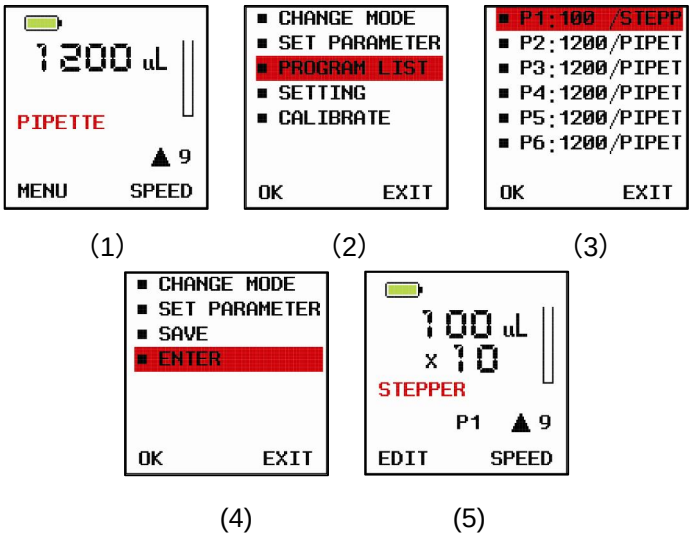


Note：

Setting up program for P1～P6 can only be done from program list. Main screen is not available for quick access programs.

Access program P1~P6

1. From previous screen in step 5⇒scroll to select **ENTER**⇒**OK** to confirm.
2. From main screen⇒ **MENU**⇒ **PROGRAM LIST** ⇒**P1** ⇒ **ENTER** as follow:



5. CALIBRATE

smartpipette is factory-calibrated with distiller water based on ISO 8655 standard. Generally, a new electronic pipette does not need calibration or configuration. For special requirement (liquid with significantly different gravities or temperature), Calibration feature is available to achieve greater accuracy.

In addition, if the device is frequently used for certain period of time, calibration process is also recommended in every 3 months.

Calibration environment

Calibration environment should be controlled with room temperature 15-30°C (±0.5°C), humidity 50%-80%. Higher level of humidity is preferred to prevent from instant evaporation of liquid sample and further influence the result. Calibration room with few air circulation, temperature meter, and humidity meter is recommended to ensure the accuracy.

Facilities

1. Analytical balance

A suitable analytical balance is determined by the volume of the electronic pipette:

Volume of electronic pipette	Reading of analytical balance	Linearity and repeatability of the analytic balance	Measurement of inaccuracy
1μL~10μL	0.001mg	0.002mg	≤0.002mg
10~100μL	0.01mg	0.02mg	≤0.02mg
>100μL	0.1mg	0.2mg	≤0.2mg

2. Pure water, dehydrogenized water or distiller water qualified with ISO 3696.
3. Shock and dust resistant area; distant from heat source and sunlight.

Procedures

To ensure accuracy, we adopt 3 calibration points (10 measurements/1 calibration point) as following procedures:

1. Clean up pipette and check lubricate condition of piston.
2. Ensure the pipette, tips, analytical balance, distiller water and all the facilities are located in the same environment for more then 2 hours.
3. Before calibration process, pre-rinse the tip by going through 5 cycles of aspirate-dispense.
4. Measure 100%, 50% and 10% of maximum volume given by the specification. 10 times each point.
5. Calculate the average value; based on it, calculate systematic error and random error based on formula specified in ISO 8655．
6. Compare the results of measurements and ISO 8655 to determine whether configuration is furthermore required.

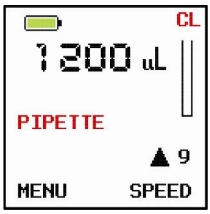
ISO 8655 Standard (Maximum permissible error)

Range	Volume (μL)	Systematic error (μL)	Random error (μL)
1~10μL	1	±0.12	≤0.08
	5	±0.12	≤0.08
	10	±0.12	≤0.08
5~100μL	5	±0.80	≤0.30
	50	±0.80	≤0.30
	100	±0.80	≤0.30
20~300μL	20	±4.00	≤1.50
	150	±4.00	≤1.50
	300	±4.00	≤1.50
100~1200μL	100	±16.0	≤6.0
	600	±16.0	≤6.0
	1200	±16.0	≤6.0
500~5000μL	500	±40	≤15
	2500	±40	≤15
	5000	±40	≤15
1000~10000μL	1000	±60	≤30
	5000	±60	≤30
	10000	±60	≤30

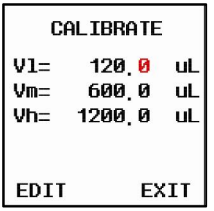
Configuration for calibration

Smartpipette has complied with ISO 8655, industrial standard, for permissible error. If different standard should be applied, proceed to configuration with following steps.

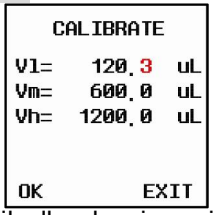
1. Press **select down** and **right** button simultaneously、then press **reset button**. Electronic pipette will restart and prompt **PRESS PIP**. Release **select down** and **right** button; Press **PIP** to enter configuration mode. Screen display **CL** in red, indicating calibration mode is ready.



2. **MENU**⇒**CALIBRATION**⇒**OK** to enter calibration screen.



3. **select** to select target value ⇒ **EDIT** ⇒blinking ⇒ press **select** key to change value(the value should be the same as average volume obtained from calibration measurement procedures) ⇒ **OK** to save.



4. Repeat step 3 until all value is verified. **OK** to save⇒ **OK** again to confirm. Screen will return to previous menu.
5. Press **reset** button; pipette will restart. Press **PIP** to enter main screen. The system has returned to normal state.
6. To confirm if verified value has been saved; **MENU**⇒ **select** key to select **CALIBRATE**⇒ **EDIT** to confirm the value. If value is not correct, repeat the process.

Note：

Only the calibration value verified in calibration mode (with CL character on screen) will be saved into system memory. In another word, the calibration value verified in regular system (no CL character on screen) will not be saved into system memory.

Calculation of mass loss

Conversion of the corrected mass to volume

V=(w+e)× Z V=Volume（μL）

w=Weight（mg）

e=Evaporation loss（mg）

Z=mg/μL correction factors

Evaporation loss has great influence to small volume pipetting. Therefore, the calculation of evaporation loss is essential to

accurate operation.

Methods

Fill certain volume of distiller water into a vessel that is weighted; Observe 30 seconds and read the volume loss and calculate the volume loss per second (if 3mg is the volume loss for 30 seconds, volume loss per second is 3mg÷30s=0.1mg/s).

During operation, the correction of mass loss can be done with above methods (operation time × volume loss / sec). However, if an evaporation prevention device is used, the consideration of evaporation loss can be omitted.

Notice: Density and volume of water under different temperature and pressure vary, Correction factors (for distiller water as a function of test temperature and air pressure) need to be taken into consideration. Refer to appendix 1 for more detail.

Systematic error

Systematic error is to calculate the difference between the actual volume and the piston operated volume.

$A = \overline{V} - V_0$ A = systematic error

$\overline{V}$ = average volume

V_0= piston operated volume

$A\% = 100\% \times A / V_0$

Random error

Random error refers to the difference of average volume of measurements and volume of single volume of measurement. The result indicates unpredictable factors, also called standard deviation S, or coefficient of variation CV.

$$S = \sqrt{\frac{\sum_{i=1}^{n}\left(V_i - \overline{V}\right)^2}{n-1}}$$

S = standard deviation

$\overline{V}$ = average volume

n = measure time

V_i = volume of single measurement

$CV = 100\% \times S / \overline{V}$

Note：

Due to the facts that calibration requires highly facilitated environment and special experience and knowledge, we do no recommend on-site calibration by customers. If the situation require, send the device back for professional service.

Before you deliver the devices, make sure it's free of contamination.

6. Troubleshooting

6.1Possible problems and recommended solution

Problem	Cause	Solution
Message with CHECK PISTON	= piston position is inappropriate	4 reinstall piston
	= lubricate for piston is insufficient	4 refresh lubricate
	= lubricate is solidified	4 refresh lubricate
	= particle on piston surface	4 clean or replace piston
	= particle between piston, o-ring, and cylinder	4 clean up piston, o-ring, and cylinder
Lack of accuracy or leak	= tip-fitting is inappropriate	4 refit the tip
	= the tip is not compatible to the device	4 replace with compatible tip
	= particle in between tip and tip holder	4 clear up tip holder
	= tip is damaged	4 replace with new tip
	= speed for aspirate is over high	4 reset the speed
	= tip is removed from liquid sample too soon	4 refer to proper operation technique
	= piston surface has dust, been damaged	4 replace or clean up piston
	= particle between piston, O-ring, and cylinder	4 clean up piston, o-ring, and cylinder
	= insufficient lubricate on O-ring or piston	4 refresh with proper amount of lubricate
	= o-ring is damaged	4 replace o-ring
	= inappropriate operation	4 refer to proper operation technique
Retention in tip	= retention of the tip is too high	4 fitting with low retention tip
	= viscosity of the liquid is high	4 use RPIPET mode; rinse the tip few times

		before pipetting; reduce speed.
Can not aspirate	= battery life is over = insufficient power	4 replace new battery 4 recharge the power
Noisy during operation	= insufficient lubricate	4 refresh lubricate
Lack of precision on special liquid sample	= inappropriate calibration, require recalibrate on high viscose liquid = when liquid sample is volatile or significantly different from water in density	4 Calibrate with proper liquid sample 4 pre-rinse the tip and calibrate with the liquid again.
Tip fall down or hard to fit	= quality of the tip = damaged tip	4 use recommended tip 4 replace new tip

If you still have question or problem, consult your local dealer for customer support. You can also call **4006 296 833** for technical support in the nation.

6.2 Leak test

Leak test should be performed from time to time to ensure the quality and precision of operation, especially after maintenance or decontamination procedure.

Methods

1. Pre-rinse the tip.
2. Set the pipette to maximum volume.
3. Aspirate the volume of distiller water.
4. Maintain the pipette in the vertical position and wait for 30 seconds.
5. If water droplet appears at the tip end, leak is confirmed.
6. If there is no droplet, re-immerse the tip into the surface of liquid.
7. If the water level inside the tip goes down, leak is confirmed. Refer to trouble shooting for solution.

Notice：Volatile liquid (or most of organic solvent) can cause leak due to the issue of saturated vapor pressure. Try to operate few cycle of aspirate-dispense and test again.

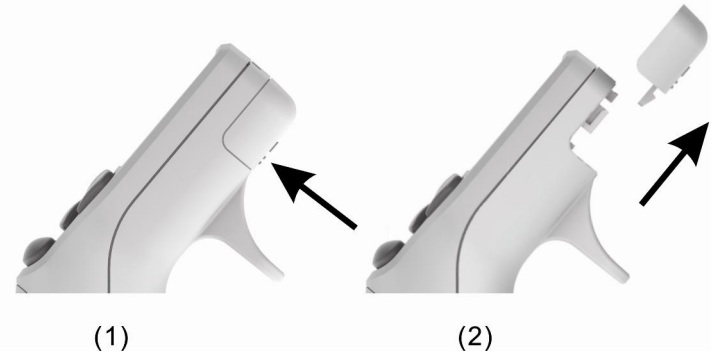
7. Disassemble and reassemble

7.1 Disassemble

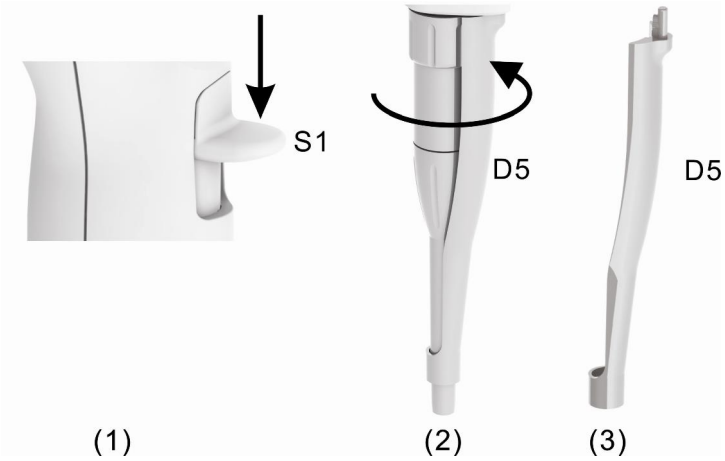
smartpipette is designed to be easy maintenance. Disassemble can be easily performed by operator.

Disassemble procedure for S10、S100、S300、S1200

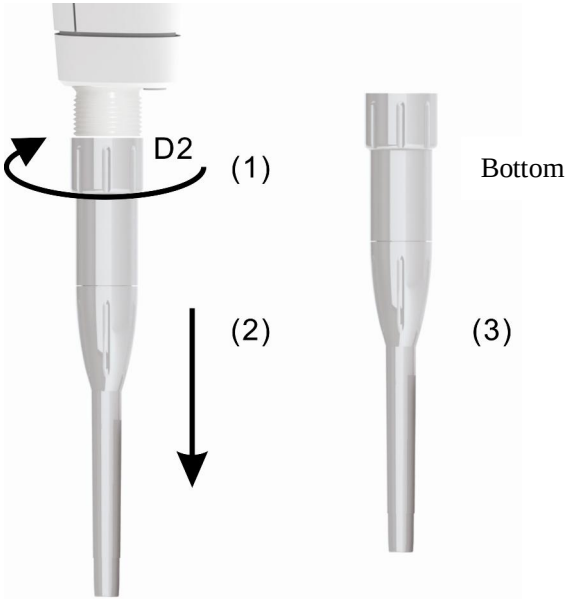
1. Remove battery block： Position your thumb and apply pressure to the cover of battery housing; slice the cover toward the direction as indication. Battery block is now easily to be sliced out.



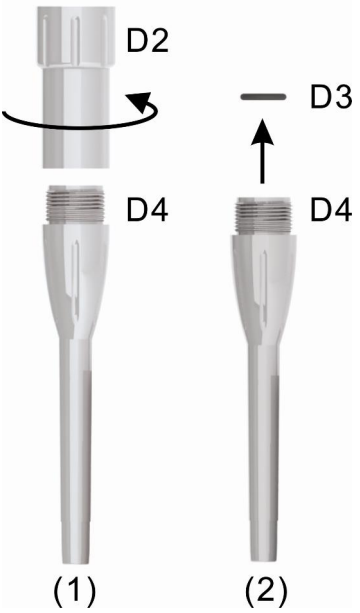
2. Keep the tip-ejector button depressed, and grip the top of the tip-ejector D5(or A5、B5、C5)with the other hand; Rotate the tip-ejector counter clock until you hear the click; pull the ejector D5(or A5、B5、C5)away from the handle of the pipette.



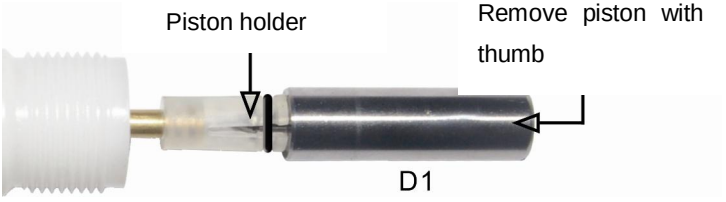
3. Remove lower section: Rotate lower part of the tip-holder counterclockwise to unscrew it and pull down from the upper part.



4. Remove o-ring (D3)：Hold on D4(orA4、B4、C4)，rotate connecting nut D2(orA2、B2、C2) counterclockwise to separate D2 and D4; remove o-ring D3(or A3、B3、C3).



5. Remove piston(D1)：Hold on upper part of pipette; Another hand will bend the piston down as you want to break it (do not pull it out). The piston will separate from piston holder D1 or A1、B1、C1).

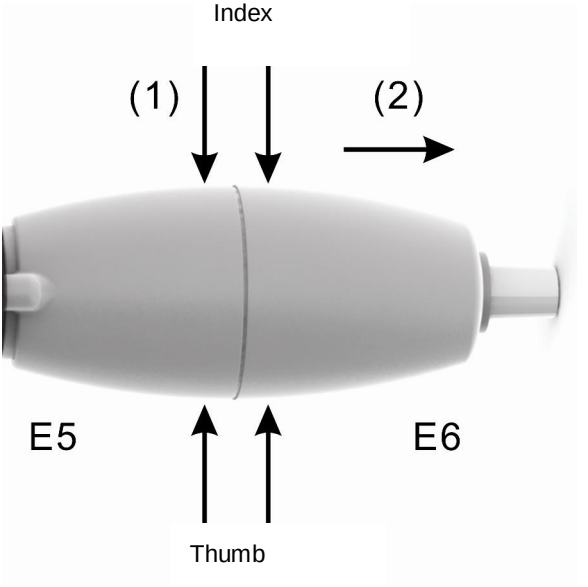


Disassemble procedure for S10、S100、S300、S1200 is completed.

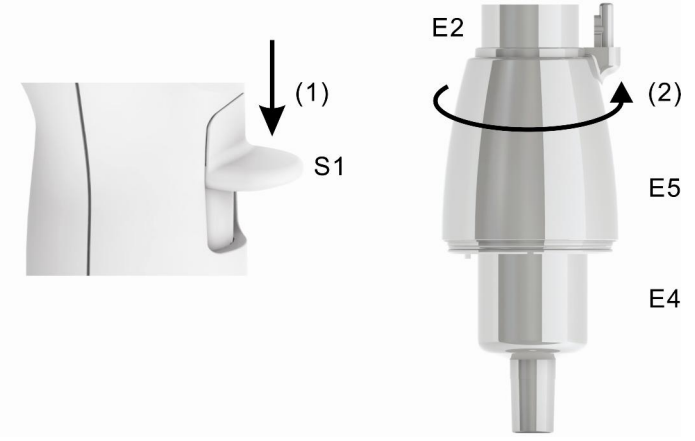
Disassemble procedure for S5mL、S10mL

1. Battery block removal: refer to the same process of S10、S100、S300、S1200.
2. Remove lower s ection of tip ejector(E6): Lie the pipette horizontal; screen face up; both hands (thumb and index

finger) hold on the intersection of E5 (or F5) and E6 (or F6) ; apply pressure to separate the two sections.

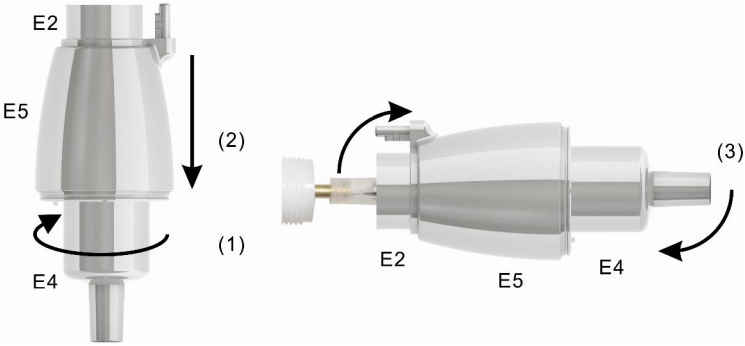


3. Remove upper section of tip ejector(E5)：Keep the tip eject button depressed; rotate upper section of tip ejector E5(or F5) toward clockwise until the hinge pop out.



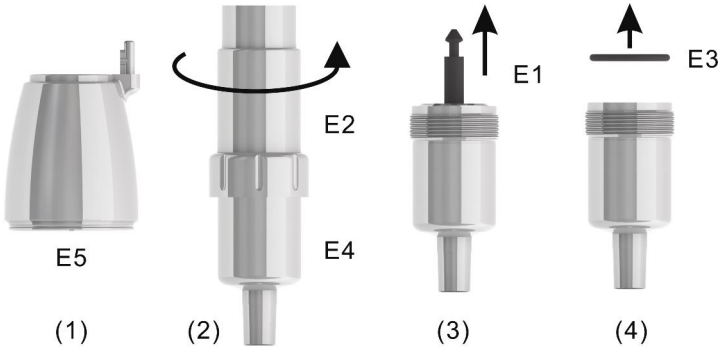
4. Remove lower section of tip holder：Rotate lower part of the tip-holder (E4)counterclockwise to unscrew it and gently pull out until piston holder presents. Bend the lower section

(in gray); the lower section including piston is detached. (the same methods apply to S10、S100、S300、S1200)



Note: To detach the loser section, you need to bend it, not to pull out.

5. Remove piston and o-ring: Remove E5; rotate counterclockwise to remove E4(or F4) from E2(or F2); remove piston E1（or F1） and o-ring E3(orF3) as diagrams showed.



So far，disassemble of S5mL、S10mL is completed.

Notice：The grip section (section that higher then piston holder) should never be disassembled. Any damage or malfunction cause by disassemble of grip section will not be covered by RONLABS warranty policy.

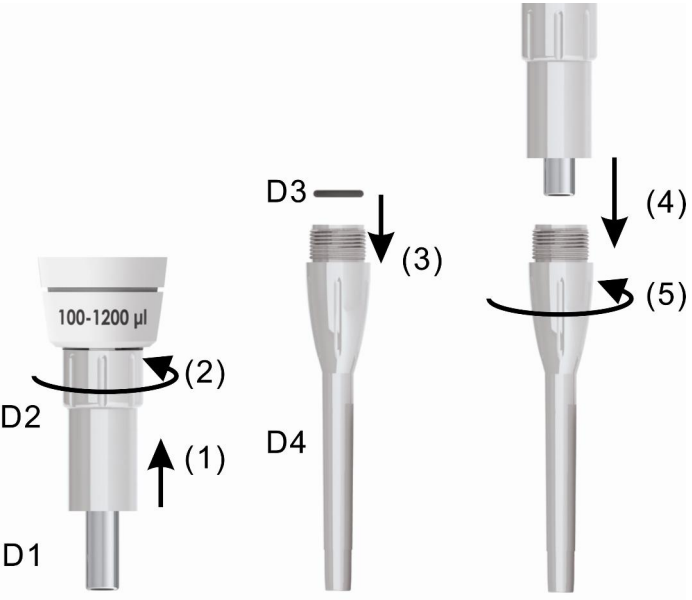
7.2 Reassemble

Reassemble procedures for S10、S100、S300、S1200

1. Reassemble piston：hold on bottom of piston D1(or A1、B1、

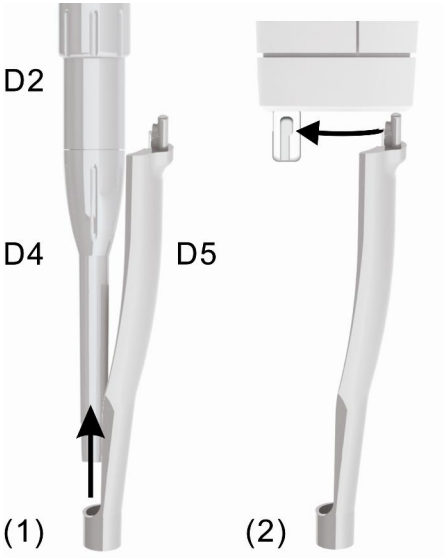
C1); gently insert the tip of piston into the piston holder as follow:

2. Restore D2（or A2、B2、C2） by rotating counterclockwise; restore o-ring D3(or A3、B3、C3) as illustrated below; connect tip holder D4 with connecting nut D2 by rotating counterclockwise.



3. Restore ejector D5(or A5、B5、C5) : Keep the ejector button S1 depressed; insert the ejector and fit the hinge section the reverse way of assemble procedures (refer to following

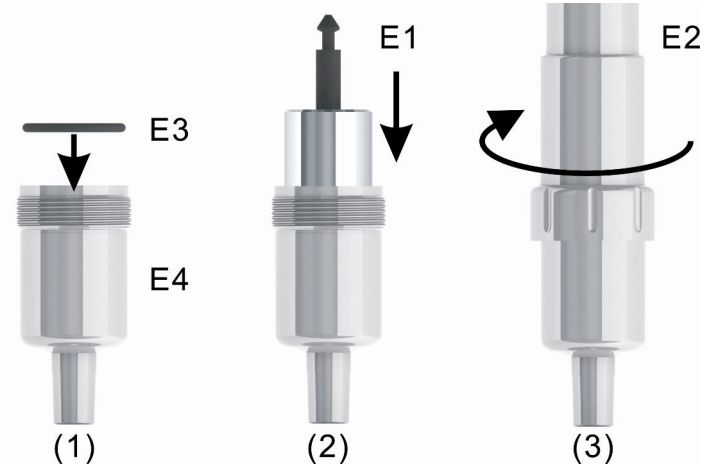
diagrams):



4. Restore battery block into battery housing; restore housing cover. Reassembly of the pipette is complete.

Reassemble procedures for S5mL、S10mL

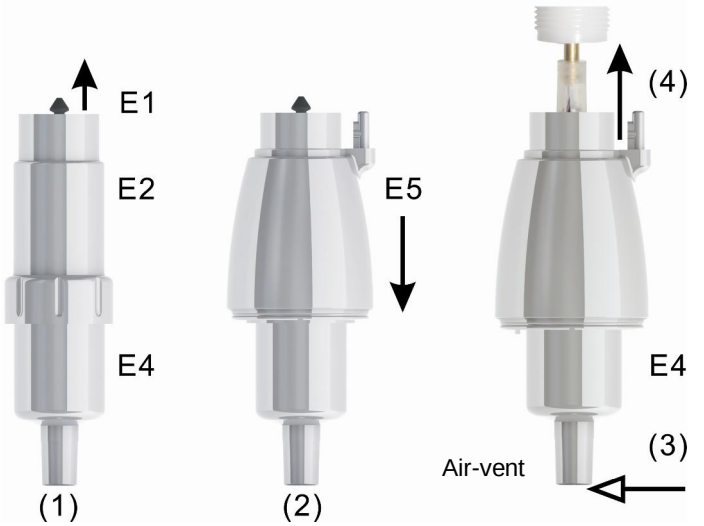
1. Use a pinch to place o-ring E3（or F3）back to E4（orF4）; insert tip of piston E1（or F1）into E2 (or F2); screw E4 into E2（or F2）.



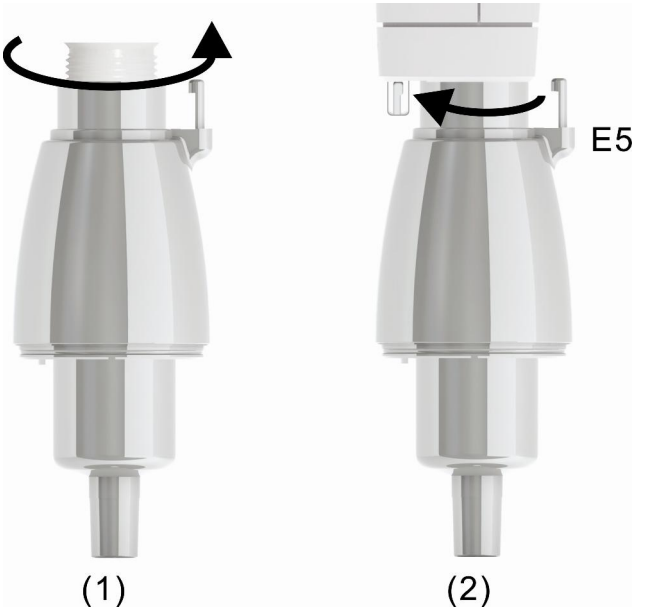
2. Restore E5（or F5）and E2（orF2）, press air-vent with finger

and insert piston-tip into piston holder.

Notice: If air-vent is not covered, the piston may not be inserted into piston holder due to air leak.



3. Screw the lower section (grey) into the grip section (white) clockwise; press down and hold the ejector button S1 and fit the hinge section E5（or F5）the reverse way of assemble procedures.



4. Restore lower section of tip ejector (there are 2 fitting notches on both E6（or F6）and E5（or F5）; match the notches in position and pop one side in first, and the other side later.
5. Restore battery block into battery housing; restore housing cover. Reassembly of the pipette is complete.

8. Maintenances

8.1 Cleaning and decontamination

Smartpipette is designed for easy maintenance as regular maintenance will ensure the accuracy and precision in your daily operation. It is especially important if the liquid you are working with is erosive solvent.

Notice：It is important to remove battery before you proceed with cleaning and decontamination.

① Exterior

Methods：Wipe the exterior with soft-cloth or lint-free tissue impregnated with 60% of IPA water. Then wipe the entire pipette again with stiller water.

Check if the exterior of pipette is clean and free of dust, especially tip holder before every operation. Leave the parts to dry by evaporation or wipe them within a clean soft-cloth.

② Interior

Procedures

1. Disassemble all part s for cleaning according proper procedure.
2. Wipe the exterior with soft-cloth or lint-free tissue impregnated with 60% of IPA water. Then wipe the entire pipette again with stiller water.
3. Generally, o-ring, piton doesn't require special cleaning. If dust or any particle is detected, wipe out with clean soft-cloth.
4. Refresh a thin layer of lubricate on o-ring and piston.
5. Reassemble according the proper procedures.

③ Decontamination

The handle is not autoclavable. Only the bottom sections including tip-ejector, tip-holder, o-ring, connecting nut, can be

autoclaved individually as following procedures:

1. Clean the parts, especially tip holder.
2. Put the parts into autoclaving sack.
3. Autoclave at 121℃, 1 bar for 20 minutes.
4. Check if the parts are dry before reassembling the pipette.
5. Set the pipette aside to stabilize for at least 2 hours.

smartpipette is produces with anti-aging material. With ultraviolet, you can expose the pipette all day without disassemble.

8.2 Easy maintenance

Different level of maintenance will be required based on different liquid sample:

Chemistry	How	Cleaning and maintenance
Aqueous solution and Buffer solution		Disassemble bottom section of the pipette; rinse contaminated parts with distiller water; leave it to dry naturally and refresh lubricate on piston.
Inorganic acid or alkali	= Use filter tips	Disassemble bottom section of the pipette; rinse contaminated parts with distiller water; leave it to dry naturally and refresh lubricate on piston.
Infectious liquid	= Use filter tips = Pipette mode	Disassemble bottom section; immerse into disinfectant for 30 minutes; perform autoclaving with stiller water
Cell culture fluid	= Use filter tips	Disassemble bottom section; immerse into disinfectant for 30 minutes; perform autoclaving with stiller water
Organic solution	= Increase operation speed	Disassemble bottom section of the pipette; rinse contaminated parts with distiller water; leave it to dry naturally and refresh lubricate on piston.

Radiation solution	= Use filter tip = Use Pipette mode	Disassemble bottom section of the pipette; rinse contaminated parts with distiller water; leave it to dry naturally and refresh lubricate on piston.
Nucleic acid or protein solution	= Use filter tip = Use Pipette mode	Nucleic acid: boil 10 minutes with amino acetic acid or hydrochloric acid buffer solution (pH2.0); rinse with distiller water and leave it to dry by evaporation or under 60℃ environment; refresh lubricate on piston. Protein: disassemble bottom section and clean with soap solution and distiller water; leave it to dry by evaporation or under 60℃ environment.

8.3 Replace battery

When the operation is significantly slow or acting abnormally due to low battery power or battery life, recharge with USB cable or replace battery block as following procedures:

1. Push the cover of battery holder and slice toward the direction indicated on battery holder.
2. Replace with new battery block accordingly.
3. Restore the cover of battery holder.
4. Turn on the device and confirm the power state.

Note：

After replacing battery, main screen and setting return to default setting.

8.4 Storage

Daily storage: After operation, hang the pipette on a pipette stand. If the tip has any liquid, never place the pipette horizontally (liquid flow into handle of the pipette may corrode piston and cause damage).

If the devices will only be used once a while, it is recommended to remove battery block, clean and decontaminate. Store the pipette in dry, clean, stable environment to preserve its' life.

9. Precautions and limitations

- Read this manual carefully and use the product according to the instructions.
- Use the product within the limitation of chemical corrosion.
- Do not aspirate highly flammable sample.
- If temperature of liquid, tip, and pipette is significantly different, the result can be very inaccurate.
- Do not operate this device close to an environment with explosive gas.
- Do not disassemble the product with abuse.
- If the product does not function normally, stop the operation and confirm troubleshooting chapter in this manual.
- Operating temperature should maintain between 15℃to40℃, relative humidity should not exceed 80%.
- Store electronic pipette, battery charger and other accessories carefully.

10. Instrument warranty

This instrument is warranted to the original purchaser by Ronlabs Scientific to be free of defects in materials or workmanship for a period of 12 months from the date of purchase, providing that is has been operated according to the instructions, not abused or misused, that the serial number has been removed, and the instrument has not been disassembled, other then procedures for normal maintenance. No other warranty is expresses or implied, including the warranty of merchantability.

Should the unit need to be returned, the purchaser must pay insurance and shipping cost charges. Ronlabs Scientific will assume the cost of returning the repaired unit to the purchaser. This products packaging is capable of withstanding normal shipping hazards.

11. Permissible errors

RONLABS smartpipette					ISO 8655	
Model	Reference range	Volume	Systematic error	Random error	Systematic error	Random error
S10	0.2-10	0.2	±0.04	≤0.02	±0.12	≤0.08
		1	±0.05	≤0.02	±0.12	≤0.08
		5	±0.08	≤0.04	±0.12	≤0.08
		10	±0.10	≤0.04	±0.12	≤0.08
S100	5-100	5	±0.40	≤0.25	±0.80	≤0.30
		10	±0.35	≤0.20	±0.80	≤0.30
		50	±0.20	≤0.15	±0.80	≤0.30
		100	±0.40	≤0.25	±0.80	≤0.30
S300	20-300	20	±0.80	≤0.40	±4.00	≤1.50
		30	±0.60	≤0.30	±4.00	≤1.50
		150	±1.00	≤0.50	±4.00	≤1.50
		300	±1.20	≤0.50	±4.00	≤1.50
S1200	100-1200	100	±2.00	≤0.50	±16.0	≤6.0
		120	±0.50	≤1.50	±16.0	≤6.0
		600	±2.00	≤2.00	±16.0	≤6.0
		1200	±4.50	≤3.00	±16.0	≤6.0
S5ml	500-5000	500	±4.00	≤2.50	±40.0	≤15.0
		2500	±8.00	≤5.50	±40.0	≤15.0
		5000	±5.00	≤6.00	±40.0	≤15.0
S10ml	1000-10000	1ml	±20.0	≤5.0	±60.0	≤30.0
		5ml	±21.0	≤10.0	±60.0	≤30.0
		10ml	±25.0	≤20.0	±60.0	≤30.0

Note：

① If there is no special remark, the unit of above data is μL.

②Test environment: PIPETTE mode, speed 9.

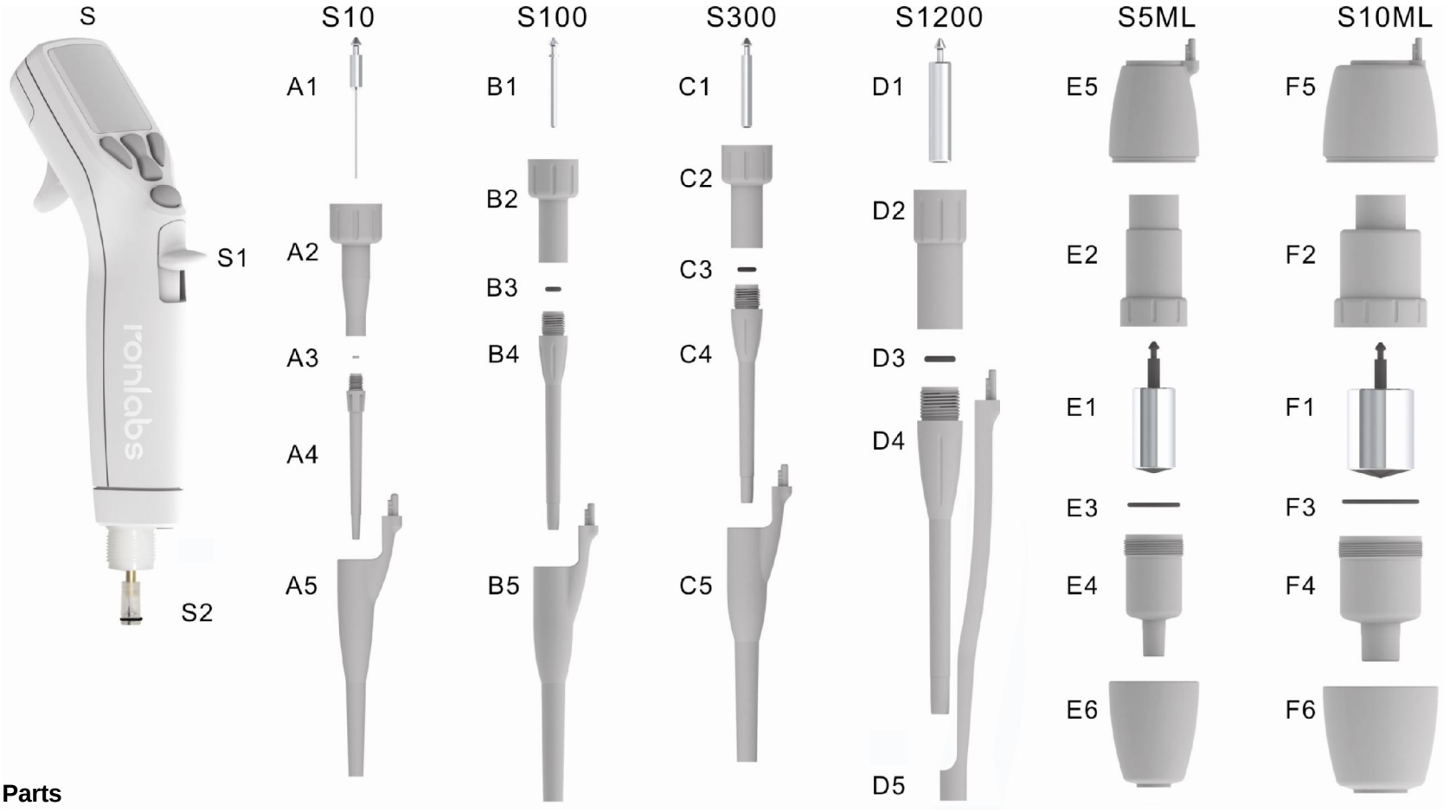
Appendix 1

Correction factors for distiller water as a function of test temperature and air pressure Z value in microlitres per milligram

Temperature	Air pressure 1KPa=10hPa						
(℃)	80	85	90	95	100	101.3	105
15.00	1.0017	1.0018	1.0019	1.0019	1.0020	1.0020	1.0020
15.50	1.0018	1.0019	1.0019	1.0020	1.0020	1.0020	1.0021
16.00	1.0019	1.0020	1.0020	1.0021	1.0021	1.0021	1.0022
16.50	1.0020	1.0020	1.0021	1.0021	1.0022	1.0022	1.0022
17.00	1.0021	1.0021	1.0022	1.0022	1.0023	1.0023	1.0023
17.50	1.0022	1.0022	1.0023	1.0023	1.0024	1.0024	1.0024
18.00	1.0022	1.0023	1.0023	1.0024	1.0025	1.0025	1.0025
18.50	1.0023	1.0024	1.0024	1.0025	1.0025	1.0026	1.0026
19.00	1.0024	1.0025	1.0025	1.0026	1.0026	1.0027	1.0027
19.50	1.0025	1.0026	1.0026	1.0027	1.0027	1.0028	1.0028
20.00	1.0026	1.0027	1.0027	1.0028	1.0028	1.0029	1.0029
20.50	1.0027	1.0028	1.0028	1.0029	1.0029	1.0030	1.0030
21.00	1.0028	1.0029	1.0029	1.0030	1.0031	1.0031	1.0031
21.50	1.0030	1.0030	1.0031	1.0031	1.0032	1.0032	1.0032
22.00	1.0031	1.0031	1.0032	1.0032	1.0033	1.0033	1.0033
22.50	1.0032	1.0032	1.0033	1.0033	1.0034	1.0034	1.0034
23.00	1.0033	1.0033	1.0034	1.0034	1.0035	1.0035	1.0036
23.50	1.0034	1.0035	1.0035	1.0036	1.0036	1.0036	1.0037
24.00	1.0035	1.0036	1.0036	1.0037	1.0037	1.0038	1.0038
24.50	1.0037	1.0037	1.0038	1.0038	1.0039	1.0039	1.0039
25.00	1.0038	1.0038	1.0039	1.0039	1.0040	1.0040	1.0040
25.50	1.0039	1.0040	1.0040	1.0041	1.0041	1.0041	1.0042
26.00	1.0040	1.0041	1.0041	1.0042	1.0042	1.0043	1.0043
26.50	1.0042	1.0042	1.0043	1.0043	1.0044	1.0044	1.0044
27.00	1.0043	1.0044	1.0044	1.0045	1.0045	1.0045	1.0046
27.50	1.0045	1.0045	1.0046	1.0046	1.0047	1.0047	1.0047
28.00	1.0046	1.0046	1.0047	1.0047	1.0048	1.0048	1.0048
28.50	1.0047	1.0048	1.0048	1.0049	1.0049	1.0050	1.0050
29.00	1.0049	1.0049	1.0050	1.0050	1.0051	1.0051	1.0051
29.50	1.0050	1.0051	1.0051	1.0052	1.0052	1.0052	1.0053
30.00	1.0052	1.0052	1.0053	1.0053	1.0054	1.0054	1.0054

Appendix 2

Parts



Parts

S：Grip section (white)

S1：Tip-ejector button

S2：Piston holder

A1-F1：Piston

A2-F2：Connecting nuts

A3-F3：O-ring

A4-F4：Tip holder

A5-D5：Tip ejector

E5、F5：Upper tip ejector

E6、F6：Lower tip ejector

S10	
611101	AS
612101	A1
613101	A2
614101	A3
615101	A4
616101	A5

S100	
611102	BS
612102	B1
613102	B2
614102	B3
615102	B4
616102	B5

S300	
611103	CS
612103	C1
613103	C2
614103	C3
615103	C4
616103	C5

S1200	
611104	DS
612104	D1
613104	D2
614104	D3
615104	D4
616104	D5

S5mL	
611105	ES
612105	E1
613105	E2
614105	E3
615105	E4
617101	E5
618101	E6

S10mL	
611106	FS
612106	F1
613106	F2
614106	F3
615106	F4
617102	F5
618102	F6

Tips (order information):

Item#	Model	Range	Color	Packing	Compatible pipettte
682010	R-10	0.5-10μL	Clear	1000/Bag，20Bag/Case	S10
682011	R-10-R	0.5-10μL	Clear	96/Rack，5Rack/Bag，10Bag/Case	S10
682020	R-200	1-200μL	Clear	1000/Bag，20Bag/Case	S100
682021	R-200-R	1-200μL	Clear	96/Rack，5Rack/Bag，10Bag/Case	S100
682030	R-300	1-300μL	Clear	1000/Bag，20Bag/Case	S100、S300
682031	R-300-R	1-300μL	Clear	96/Rack，5Rack/Bag，10Bag/Case	S100、S300
682120	R-1250	100-1250μL	Clear	1000/Bag，5Bag/Case	S1200
682121	R-1250-R	100-1250μL	Clear	96/Rack，5Rack/Bag，10Bag/Case	S1200
682500	R-5m	1-5mL	Clear	100/Bag，10Bag/Case	S5mL
682501	R-5m-R	1-5mL	Clear	54/ Rack，10Rack /Case	S5mL
682600	R-10m	1-10mL	Clear	100/Bag，10Bag/Case	S10mL
682601	R-10m-R	1-10mL	Clear	24/ Rack，10Rack /Case	S10mL
682605	R-10m-E	1-10mL	Clear	100/Bag，10Bag/Case	S10mL

Above are recommended partial model; please refer to www.ronlabs.com for more information.

Accessories (order information)：

Battery

Item #	693101
Model	RA-E9m
Type	Lithium-Ion
Voltage	3.7V
Rated capacity	900mAh
Maximum charging Voltage	4.2V
Charging time	2h*

Note：★ When use with Ronlabs original product

Battery charger

Item＃	693201
Model	RA-DC1
Color	White
Input（AC）	100-240V，50/60Hz，Max 0.15A
Output（USB）	5V,500mA

USB cable

Item#	693301
Model	RA-MT1
Color	White

Lubricate

Item#	693401
Model	RA-GR1

Above are recommended partial model; please refer to www.ronlabs.com for more information.

★Any modification of this user manual will not be noticed in advance.
Please check www.ronlabs.com for newest version,

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